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UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF PUBLIC ROADS  
DIVISION OF AGRICULTURAL ENGINEERING

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MONTHLY NEWS LETTER

WASHINGTON, D.C., JANUARY 20, 1926

BEGINNING WITH THIS, THE FIRST ISSUE OF THE NEW YEAR, THE ENDEAVOR WILL BE MADE TO MAKE THE MONTHLY NEWS LETTER OF MORE REAL VALUE TO THE FORCE. THIS WILL BE ACCOMPLISHED BY INCLUDING MORE MATTER OF TECHNICAL INTEREST AND LESS OF A PERSONAL CHARACTER. THE MEMBERS OF THE FORCE ARE EARNESTLY REQUESTED TO CONTRIBUTE ITEMS OF INTEREST (NOT EXCEEDING 300 WORDS IN LENGTH) THAT HAVE DEVELOPED IN THEIR WORK, OR ITEMS THAT HAVE OTHERWISE COME TO THEIR ATTENTION AND PROBABLY WILL NOT APPEAR ELSEWHERE. I BELIEVE THAT THE FILE OF THE NEWS LETTER CAN THUS BE MADE A VALUABLE REFERENCE MEDIUM.

S. H. McCrory

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DRAINAGE

MR. McCrory LEFT WASHINGTON JANUARY 16 FOR OKLAHOMA CITY WHERE HE WILL DELIVER AN ADDRESS ENTITLED "DRAINAGE THAT PAYS" BEFORE THE NATIONAL DRAINAGE CONGRESS AT THEIR ANNUAL MEETING JANUARY 18, 19, AND 20. HE WILL THEN VISIT PROF. DAVIDSON, AT AMES, IOWA, IN CONNECTION WITH THE FARM IMPLEMENT RESEARCH INVESTIGATION AND WILL ALSO CONFER WITH D. G. MILLER AT ST. PAUL AND WITH F. F. SHAFER, AT QUINCY, ILLINOIS.

F. F. SHAFER'S PROGRESS REPORT ON COMPARATIVE COSTS OF DRAINAGE PUMPING AS AFFECTED BY THE TYPE OF POWER USED, ISSUED IN MIMEOGRAPHED FORM, HAS AROUSED CONSIDERABLE INTEREST IN THE DRAINAGE PUMPING FIELD. COMMENTS GENERALLY ARE FAVORABLE BUT SOME CRITICISM HAS BEEN EXPRESSED REGARDING CERTAIN DETAILS OF PROCEDURE.

O. E. RAMSER HAS COMPUTED THE VALUE OF "N" ON THE ST. FRANCIS RIVER FLOODWAY IN NORTHEAST ARKANSAS AS FOLLOWS: 0.153, 0.155 AND 0.168 FOR SLOPE COURSES OF 4,000, 6,000 AND 8,000 FEET RESPECTIVELY. WIDTH OF FLOODWAY 2,204 FEET, MEAN DEPTH OF WATER 3.93 FEET. THE FLOODWAY IS COVERED BY A THICK SECOND GROWTH WITH CONSIDERABLE UNDERBRUSH. SINCE THE AVERAGE VELOCITY WAS ONLY 0.225 FOOT PER SECOND, NO GREAT ACCURACY IN VELOCITY MEASUREMENT COULD BE EXPECTED. THE RESULTS, HOWEVER, ARE SUFFICIENT TO SHOW THAT IN SPITE OF THE LARGE DIMENSIONS OF THE FLOODWAY, NOT MUCH WATER (1951 SEC. FT.) WAS ACTUALLY CARRIED. THE DEPTH OF FLOW FOR WHICH THIS FLOODWAY WAS PLANNED IS ABOUT 8 FEET. THE MEASUREMENTS WERE MADE AT A FLOOD CREST. IT IS MR. RAMSER'S OPINION THAT MEASUREMENTS AT A HIGHER STAGE WOULD SHOW A LOWER VALUE OF "N" BUT ONE STILL CONSIDERABLY GREATER THAN 0.060, UPON WHICH FIGURE THE DESIGN OF THE FLOODWAY WAS BASED.







DRAINAGE AND FLOOD CONTROL ENGINEERING BY GEORGE W. PICKELS, C. E., ASSOC. PROF. OF DRAINAGE ENGINEERING AT THE UNIV. OF ILL. (McGraw-Hill Book Co., N.Y., 1925). IT IS WRITTEN AS A TEXT-BOOK FOR COURSES IN LAND DRAINAGE, TO SHOW THE BASIS OF THIS ART UPON "THE FUNDAMENTAL SCIENCES OF HYDROLOGY, HYDRAULICS, AND SOIL PHYSICS."

THE INTRODUCTION DWELLS BRIEFLY UPON THE IMPORTANCE, DEVELOPMENT, AND FUTURE OF DRAINAGE AND FLOOD CONTROL IN THE UNITED STATES. A CHAPTER ON PRECIPITATION DISCUSSES THE CAUSES AND GEOGRAPHICAL DISTRIBUTION OF RAINFALL, AND THE FREQUENCY AND INTENSITY OF HEAVY STORMS. ANOTHER ON FLOOD RUN-OFF DISCUSSES THE INFLUENCE OF DIFFERENT WATERSHED CHARACTERISTICS UPON THE RATE OF FLOW AND THE METHOD OF ESTIMATING FUTURE RUN-OFF. THE MEASUREMENT OF STREAM DISCHARGES IS DESCRIBED IN A SEPARATE CHAPTER. FLOW IN OPEN CHANNELS, ONE OF THE LONGER CHAPTERS, INCLUDES A COMPARISON OF FORMULAE, GIVING TABLES OF COEFFICIENTS, AND A DISCUSSION OF SILTING, EROSION, AND CRITICAL VELOCITIES. THE CHAPTER ON FLOW IN TILE DRAINS IS SIMILAR. THE DESIGN OF OPEN DITCH DRAINAGE SYSTEMS IS BEGUN BY A DISCUSSION OF ECONOMICS OF LAND DRAINAGE, POINTING OUT OTHER COSTS BESIDES DRAINAGE INVOLVED IN TURNING SWAMP LAND INTO FARMS. THE DESIGN AND CONSTRUCTION OF UNDER-DRAINAGE SYSTEMS IS PRECEDED BY THE CHAPTER ON SOIL PHYSICS. DRAINAGE PUMPING EQUIPMENT AND PLANT DESIGN ARE DESCRIBED IN CONSIDERABLE DETAIL. FLOOD CONTROL BY CHANNEL IMPROVEMENT, BY LEVEES, AND BY RESERVOIRS IS DISCUSSED THROUGH THREE CHAPTERS, THE LAST PRESENTING BRIEFLY PLANS AND STRUCTURES ADOPTED OR PROPOSED FOR SEVERAL LARGE PROJECTS. EXCAVATING IMPLEMENTS AND MACHINERY ARE DESCRIBED, AND SOME COST FIGURES ARE GIVEN. THE FINAL CHAPTER, ON DRAINAGE LAW, CITES THE COMMON LAW PRINCIPLES INVOLVED IN LAND DRAINAGE, AND THE GENERAL PROVISIONS OF THE DRAINAGE STATUTES; DETAILS THE USUAL PROCEDURE IN ORGANIZING A DRAINAGE DISTRICT; AND DISCUSSES THE BASIS AND METHODS OF LEVYING ASSESSMENTS AGAINST AGRICULTURAL LAND, RAILROADS, HIGHWAYS, AND CITIES.

AS ARTHUR. E. MORGAN POINTS OUT IN A 2000 WORD REVIEW (ENG. N.R. DEC. 17, 1925,) THE BOOK IS A COMPILATION, BUT SO ORGANIZED AS TO BE A CONSISTENT TREATMENT OF THE WHOLE SUBJECT. HE POINTS OUT SOME SHORTCOMINGS BUT IN CONCLUSION STATES THAT THE AUTHOR "HAS RENDERED A MOST VALUABLE SERVICE IN COLLECTING A JUDICIOUS SELECTION OF SUBJECT MATTER," AND THAT "NO PREVIOUS BOOK ON THE SUBJECT IS COMPARABLE TO THIS ONE IN COMPREHENSIVENESS OR ORDERLINESS OF PRESENTATION."

## IRRIGATION

W.W. McLAUGHLIN, FRANK ADAMS, AND O.V.P. STOUT, ATTENDED THE MEETING OF THE PACIFIC COAST SECTION OF THE A.S.A.E. AT DAVIS, CALIF., OF WHICH MR. ADAMS IS CHAIRMAN. MAJOR STOUT READ A PAPER ENTITLED "THE FIELD OF THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS IN RECLAMATION."

CARL ROHWER HAS BEEN ENGAGED IN PLANNING CORRECTIONS FOR THE EFFECT OF TEMPERATURE ON THE EVAPORATION APPARATUS AT FORT COLLINS, COLO. MR. ROHWER HAS ALSO PREPARED BLUE PRINTS AND A COST ESTIMATE OF AN EVAPORATION PAN 100 FEET IN DIAMETER, WITH A CONCRETE WALL 3 FEET HIGH, FACED WITH GALVANIZED IRON, AND WITH A FLOOR OF HEAVY TAR ONE INCH THICK, TO MAKE POSSIBLE A COMPARISON OF EVAPORATION LOSSES FROM SMALL PANS WITH THOSE FROM RESERVOIRS.

A. L. FELLOWS ATTENDED THE ANNUAL CONVENTION OF THE NEBR. IRRIG. ASSN AT BRIDGEPORT, NEBR., WHERE HE DELIVERED AN ADDRESS ON "IRRIGATION PROBLEMS OF





THE GREAT PLAINS." MR. FELLOWS REPORTS THAT AN ATTEMPT IS BEING MADE ALONG THE REPUBLICAN RIVER IN NEBRASKA TO FURNISH POWER AT LOW RATES TO FARMERS DESIRING TO OBTAIN WATER FOR IRRIGATION BY PUMPING.

E. J. HOFF IS CONDUCTING EXPERIMENTS DESIGNED TO PRODUCE A CURRENT METER WHICH WILL RESPOND RELIABLY TO THE MINUTE FORCES SET UP BY THE LOWER STREAM VELOCITIES. A ROTATING METER TO RECORD THESE FORCES MUST BE SO DELICATE THAT IT IS INFEASIBLE, IF NOT IMPOSSIBLE, OF CONSTRUCTION. THEREFORE EFFORTS ARE DIRECTED TOWARD SOME FORM OF NON-ROTATING DEVICE.

W. L. STOCKWELL, JR., REPORTS THAT THE WORK ON THE MUDDY VALLEY, NEV., DRAINAGE EXPERIMENT HAS BEEN FINISHED AND ONE SET OF READINGS TAKEN SHOWING THAT THE WATER TABLE STANDS ABOUT FOUR FEET FROM THE SURFACE OF THE GROUND IN THE VALLEY.

ARTHUR FIFE, WORKING UNDER L. M. WINSOR'S DIRECTION, HAS MADE A STUDY OF FARMS IN THE MILFORD AREA, UTAH, WHICH ARE BEING SUCCESSFULLY OPERATED UNDER IRRIGATION BY PUMPING. MR. WINSOR'S ASSISTANT, O. W. MONSON, HAS PLOTTED CROSS-SECTIONS OF THE GRAVEL DEPOSITS AT THE BARRIERS AT SEVERAL POINTS IN UTAH.

R. G. HEMPHILL HAS WORKED OVER THE MEDINA LAKE SILT SURVEY NOTES TO TRY THE EFFECT OF ARRIVING AT THE SILT DEPOSIT BY APPLYING THE MEASURED DEPTH OF SILT BETWEEN 10-FOOT CONTOURS TO THE AREA BETWEEN THE CONTOURS. THIS GIVES A LOWER RESULT THAN THE METHOD OF APPLYING THE AVERAGE DEPTH OF SILT AT TWO CROSS-SECTIONS TO THE ESTIMATED SILTED AREA BETWEEN, AND IS BELIEVED BY MR. HEMPHILL TO BE THE BETTER METHOD AS IT TAKES INTO CONSIDERATION THE VARYING AREAS ON WHICH THE DIFFERENT DEPTHS OF SILT ARE FOUND. O. A. FARIS HAS SUBMITTED A PROGRESS REPORT ON THE SILT SURVEY OF LAKE KEMP ON BIG WICHITA RIVER, TEXAS.

R. A. HART RESIGNED FROM THE GOVERNMENT SERVICE, EFFECTIVE DECEMBER 31, LAST. IT IS UNDERSTOOD THAT MR. HART IS TO ACT AS SECRETARY-MANAGER OF THE WESTERN CLAY PRODUCTS ASSOCIATION AT AN ADVANCE IN SALARY. MR. HART ENTERED THE SERVICE IN 1908 AND HAS GIVEN HIS ATTENTION LARGELY TO THE DRAINAGE OF IRRIGATED LANDS.

#### BUILDINGS AND MECHANICS

MR. ELMER JOHNSON ATTACHED TO THE DELTA LABORATORY, TALLULAH, LA., IS IN WASHINGTON INVESTIGATING PHASES OF COTTON DUSTING MACHINERY UPON WHICH HE IS WORKING IN COOPERATION WITH THE BUREAU OF ENTOMOLOGY.

MR. JONES AND MR. BETTS ATTENDED THE ANNUAL MEETING OF THE NORTH ATLANTIC SECTION, A.S.A.E., HELD AT SCHENECTADY, N.Y. DEC. 10, 11, AND 12.

THIS DIVISION IS COOPERATING WITH THE BUREAU OF PLANT INDUSTRY IN EXPERIMENTAL WORK ON THE STORAGE OF POTATOES IN WAREHOUSES. A WAREHOUSE AT PRESQUE ISLE, MAINE, WAS MODIFIED AND THE EFFECT IS BEING OBSERVED. THE RESULTS SO FAR OBTAINED INDICATE THE DESIRABILITY OF ADDITIONAL INSULATION AND BETTER VENTILATION. MORE CONCLUSIVE EVIDENCE WILL DOUBTLESS BE OBTAINED TOWARD THE END OF THE STORAGE SEASON.







CONSIDERABLE INTEREST WAS MANIFESTED IN THE WORKING DRAWINGS OF FARM STRUCTURES WHICH WERE EXHIBITED AT THE LIVESTOCK SHOW, HELD IN CHICAGO DURING DECEMBER. AS A CONSEQUENCE OF THIS INTEREST, THE DIVISION DISTRIBUTED ABOUT 900 DRAWINGS TO 300 FARMERS.

#### SURPLUS WAR EXPLOSIVES

PYROTOL SHIPMENTS FOR DECEMBER AMOUNTED TO 1,366,600 POUNDS, BRINGING THE TOTAL SHIPPED UP TO JANUARY 1, FOR LANDCLEARING, TO 15,719,450 POUNDS.

#### BULLETINS AND REPORTS

THE MANUSCRIPT FOR A FARMERS' BULLETIN DEALING WITH THE CONSTRUCTION OF PAVEMENTS, FLOORS, TANKS AND OTHER SMALL FARM EQUIPMENT TO BE BUILT OF CONCRETE, WAS TRANSMITTED TO THE PRINTER. ANOTHER FARMERS' BULLETIN DESCRIBING THE METHOD OF USING RAMMED EARTH IN WALL CONSTRUCTION - A VERY OLD FORM OF BUILDING SOMETIMES KNOWN AS PISE - HAS ALSO BEEN SUBMITTED FOR PUBLICATION. THE TEXT FOR THIS LATTER PUBLICATION WAS COMPILED FROM LITERATURE PUBLISHED IN ENGLAND, FRANCE AND GERMANY AS LITTLE IS KNOWN IN THIS COUNTRY OF THE PROCESS.

INFORMATION SERIES #61 "RAT PROOFING STRUCTURES" HAS BEEN PREPARED IN MIMEOGRAPH FORM OUTLINING FEASIBLE PROTECTIVE METHODS AND LISTING BULLETINS PUBLISHED ON THE SUBJECT.

R. A. HART HAS SUBMITTED THE FOLLOWING REPORTS:

PROGRESS REPORT OF INVESTIGATIONS IN SAN PITCH RIVER DRAINAGE DISTRICT, IN SANPETE COUNTY, UTAH.

PROGRESS REPORT OF INVESTIGATIONS IN FRANKLIN COUNTY DRAINAGE DISTRICT No. 3, AT BANIDA, IDAHO.

SOME MAINTENANCE PROBLEMS OF DRAINAGE SYSTEMS FOR IRRIGATED LANDS.

REPORT OF A STUDY OF FLUCTUATIONS OF GROUND WATER TABLE AT FAYETTE, UTAH.

VIEWS OF STRUCTURES AND MACHINERY, NEW HOPE DRAINAGE DISTRICT, SANTA ANA, CALIFORNIA.

SUGGESTIVE SPECIFICATIONS FOR THE CONSTRUCTION OF DRAINAGE SYSTEMS FOR THE DRAINAGE OF IRRIGATED LANDS.

L. M. WINSOR HAS SUBMITTED "ANNUAL REPORT, COOPERATIVE IRRIGATION INVESTIGATIONS AND DEMONSTRATIONS IN THE STATE OF UTAH."

